

**CITY OF POTLATCH (PWS 2290030)**  
**SOURCE WATER ASSESSMENT FINAL REPORT**

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**October 16, 2002**



**State of Idaho**  
**Department of Environmental Quality**

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## Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated source water assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *Source Water Assessment for City of Potlatch, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source.

**The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The City of Potlatch drinking water system consists of four wells. The Ridge Well, Potlatch Well, Ball Field Well, and Well #4 supply approximately 880 people through 349 connections.

Final susceptibility scores are derived from equally weighing system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential Contaminants/Land Uses are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic contaminants (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of total susceptibility, the Ridge Well rated high for IOCs, VOCs, SOCs, and moderate for microbials. System construction and hydrologic sensitivity are both moderate, and land use rated high for IOCs, VOCs, SOCs, and moderate for microbials.

In terms of total susceptibility, the Potlatch Well rated automatically high for IOCs, VOCs, SOCs, and microbials due to a drainage ditch existing within the 50 foot sanitary setback distance of the well. If not for the automatic ratings, the well would have rated moderate for all four types of contaminants. System construction rated high, hydrologic sensitivity rated moderate, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbials. If the missing well log information had been available, scores might have been lower.

In terms of total susceptibility, the Ball Field Well rated automatically high for IOCs, VOCs, SOCs, and microbials due the surface water diversion ditches existing within the 50 foot sanitary setback distance of the well. If not for the automatic rating, the Ball Field Well would have rated moderate for IOCs, VOCs, SOCs, and microbial contaminants. System construction and hydrologic sensitivity both rated moderate, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbials.

In terms of total susceptibility, Well #4 rated moderate for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity both rated moderate, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbials.

No VOCs or SOCs have ever been detected in any of the wells. Trace concentrations of have been detected, but significantly below maximum contamination levels (MCLs) as set by the Environmental Protection Agency (EPA). For instance, trace amounts of barium, fluoride, and natural radiation were detected in at least one of the wells. Arsenic was detected in concentrations of 7 parts per billion (ppb) in the Ridge Well (September 1997), and in concentrations of 13 ppb (December 1994), 11 ppb (October 1997), and 9 ppb (May 2001) in Well #4. In October 2001, EPA lowered arsenic's MCL from 50 ppb to 10 ppb, however, public water systems have until 2006 to meet the new requirement. As the City of Potlatch water system exists within a county of medium nitrogen fertilizer use, high herbicide use, and high ag chemical use, nitrate contamination may become a water quality issue. At the present time however, nitrate has only been detected in the Ridge well in concentrations of 0.5 parts per million (ppm), significantly below its MCL of 10 ppm. Total coliform has been detected in the distribution system three times (May 1998, December 1995, and June 1995).

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the City of Potlatch, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Actions should be taken to keep a 50-foot radius circle clear of all potential contaminants from around the wellhead. Any contaminant spills within the delineation should be carefully monitored and dealt with. As much of the designated protection areas are outside the direct jurisdiction of the City of Potlatch, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection. In addition, the well should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. For assistance in developing protection strategies please contact the Lewiston Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

# SOURCE WATER ASSESSMENT FOR CITY OF POTLATCH, IDAHO

## Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the rankings of this assessment mean.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment is also included.

### Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the EPA to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

### Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The local community, based on its own needs and limitations, should determine the decision as to the amount and types of information necessary to develop a drinking water protection program. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

## **Section 2. Conducting the Assessment**

### **General Description of the Source Water Quality**

The City of Potlatch drinking water system consists of four wells. The Ridge Well, Potlatch Well, Ball Field Well, and Well #4 supply approximately 880 people through 349 connections.

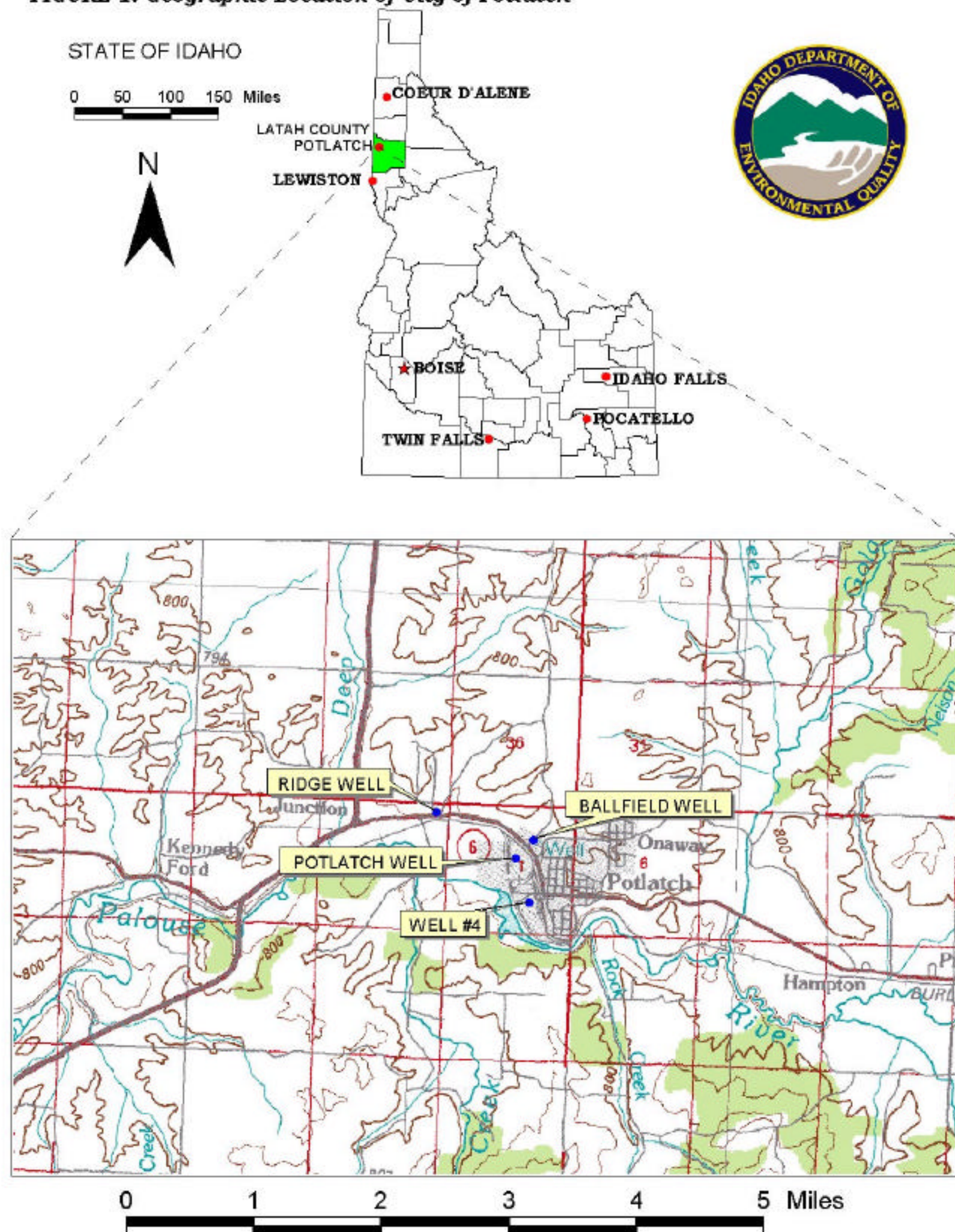
No VOCs or SOCs have ever been detected in any of the wells. Trace concentrations of IOCs have been detected, but significantly below MCLs as set by EPA. Barium, fluoride, and natural radiation were detected in at least one of the wells. Arsenic was detected in concentrations of 7 ppb in the Ridge Well (September 1997), and in concentrations of 13 ppb (December 1994), 11 ppb (October 1997), and 9 ppb (May 2001) in Well #4. In October 2001, EPA lowered arsenic's MCL from 50 ppb to 10 ppb, however, public water systems have until 2006 to meet the new requirement. As the City of Potlatch water system exists within a county of medium nitrogen fertilizer use, high herbicide use, and high ag chemical use, nitrate contamination may become a water quality issue. At the present time however, nitrate has only been detected in the Ridge well in concentrations of 0.5 ppm, significantly below its MCL of 10 ppm. Total coliform has been detected in the distribution system three times (May 1998, December 1995, and June 1995).

### **Defining the Zones of Contribution – Delineation**

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with the University of Idaho to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water in the vicinity of the City of Potlatch wells. The computer model used site specific data, assimilated by the University of Idaho from a variety of sources including operator input, local area well logs, and hydrogeologic reports (detailed below).

The conceptual hydrogeologic model for the six public water systems in the Potlatch, Idaho area is based on interpretation of available well logs and published geologic maps of the area. The bedrock geologic map of the Potlatch quadrangle at a scale of 1:24,000 (Duncan, 1998) covers the locations of the City of Potlatch, Onaway, and the Y Trailer Court source wells. To the east, geologic information for Delfred Cone, Bennett Lumber, and Hoodoo Harvard Water and Sewer source wells was obtained from the 1:250,000 geologic map (Rember and Bennett, 1979). Well log data indicate that the hydrogeology of the area is complex and very little information is available on the local hydrogeology.

**FIGURE 1. Geographic Location of City of Potlatch**



The eleven source wells of the six public water systems included in this study are located along an approximately 11 mile stretch of the Palouse River valley. The ground elevation is approximately 2600 feet above mean sea level (msl) at the eastern end, near the town of Harvard, and approximately 2480 feet at the western end near the City of Potlatch. Well logs are available for all but two source wells (Potlatch “Potlatch Well” and Potlatch “Ball Field Well”). Those two wells are assumed to have a similar hydrogeology as Potlatch “Well #4” due to their proximity. Well logs for source wells and the test points are used to interpret the hydrogeology. The wells are completed in a variety of geologic units that do not appear to be laterally continuous in the valley. Local geology consists of Precambrian basement rock (granitic, metamorphic, and metasedimentary units) overlain by the Columbia River Basalt Group (CRBG) and interbedded sediments, which in turn are overlain by Palouse loess and alluvial sediments. The CRBG consists of (from oldest to youngest) the Grande Ronde Formation, the Wanapum Formation, and the Onaway basalts of the Saddle Mountain Formation.

Although the Wanapum and Grande Ronde formations are hydrologically distinct in the Moscow-Pullman Basin approximately 15 miles to the south, the available data do not justify a similar distinction in the Potlatch area. This is due in part to the laterally discontinuous nature of the units and the difficulty in interpreting driller’s well logs and static water level data. Static water level elevations, as reported on well logs, average around 2500 ft (msl) and range from approximately 240 ft (msl) (Potlatch “Ridge Well”) to 2600 ft (msl) (Hoodoo Harvard Well). Another complicating factor is that the available static water level data span a period of 25 years, making it difficult to distinguish between actual differences in static head and temporal changes in water levels.

The University of Idaho’s report divides the sources into three different aquifers. These are the basalt, argillite/shale and sediment aquifers. Several different models were constructed for each aquifer. The basalt models include the Delfred Cone Well, Hoodoo Harvard Well and Onaway Well #3. Bennett Lumber South and North Wells and Potlatch Well1 are simulated as argillite/shale aquifers. However, Potlatch “Ridge Well” is modeled separately because it is far from the other two sources and there are no test points near it. The sediment model includes the Y Trailer Court Well and Potlatch “Potlatch Well”, “Ball Field Well”, “Well #4”. Because the geology is quite complex in the Potlatch area, most wells are screened (or are open) in more than one aquifer. However, the source wells were modeled as fully penetrating a single aquifer based on well log data and the aquifer material from which water is believed to be derived.

Discharge from these source wells does not generally exceed 50 gpm, regardless of the aquifer material. For comparison, wells located in basalt aquifers of the Moscow-Pullman Basin produce up to 2,500 gpm (Osiensky et al., 2000).

Neighboring private wells were used for test points. Information on test points was obtained from a search of the Idaho Department of Water Resources databases available on the internet. The locations of the test points are limited to information supplied on well logs, typically the quarter-quarter section (0.25 square mile). Therefore, the accuracy of the test point elevation and the static water elevation is dependent upon the accuracy of the driller’s log and the relief in the quarter-quarter section.

The capture zones delineated herein are based on limited data and must be taken as best estimates. If more data become available in the future these delineations should be adjusted based on additional modeling incorporating the new data.

The delineated source water assessment areas for the well of City of Potlatch wells can best be described as circles ranging in size from 0.25 miles in diameter to 1.75 miles in diameter (Figures 2, 3, 4, and 5). The actual data used by the University of Idaho in determining the source water assessment delineation area is available from DEQ upon request.

### **Identifying Potential Sources of Contamination**

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area and the surrounding area of the City of Potlatch's wells is mostly agricultural.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

### **Contaminant Source Inventory Process**

A two-phased contaminant inventory of the study area was conducted in March 2002. The first phase involved identifying and documenting potential contaminant sources within the City of Potlatch source water assessment areas (Appendix A, Figure 2, 3, 4, 5) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

The delineated source water assessment areas of the City of Potlatch wells contain underground storage tanks (USTs), leaking underground storage tanks (LUSTs), a national pollutant discharge elimination system (NPDES site), superfund amendment and reauthorization act (SARA) sites, a comprehensive environmental response compensation and liability Act (CERCLA), and some service and industrial related businesses (Table 1, 2, 3, 4 and Appendix A Figure 2, 3, 4, 5). In addition, the Palouse River, Burlington Northern Railroad, Highway 95, and Highway 6 exist within the delineations. These sources can contribute leachable contaminants to the aquifer in the event of an accidental spill, release, or flood.



**Table 1. City of Potlatch, Ridge Well, Potential Contaminant Inventory.**

Site	Description of Source <sup>1</sup>	TOT <sup>2</sup> Zone	Source of Information	Potential Contaminants <sup>3</sup>
1	UST site	0-3 YR	Database Search	VOC, SOC
2	Horse training site	0-3 YR	Database Search	IOC, SOC, Microbials
3, 4, 8	LUST site, UST site, Sara site	3-6 YR	Database Search	IOC, VOC, SOC
5, 9	NPDES site, SARA site	3-6 YR	Database Search	IOC, VOC, SOC
6	CERCLA site	3-6 YR	Database Search	IOC, VOC, SOC
7	Clay Mine	3-6 YR	Database Search	IOC, VOC, SOC
10	Service Station	6-10 YR	Database Search	IOC, VOC, SOC
	Burlington Northern Railroad	0-10 YR	GIS Map	IOC, VOC, SOC, Microbials
	Highway 95	6-10 YR	GIS Map	IOC, VOC, SOC
	Highway 6	0-10 YR	GIS Map	IOC, VOC, SOC, Microbials

<sup>1</sup> UST =Underground Storage Tank, LUST = Leaking Underground Storage Tank, SARA = Superfund Amendments and Reauthorization Act, NPDES = National Pollutant Discharge Elimination System, CERCLA = comprehensive environmental response compensation and liability Act

<sup>2</sup> TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

<sup>3</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

**Table 2. City of Potlatch, Potlatch Well, Potential Contaminant Inventory.**

Site	Description of Source <sup>1</sup>	TOT <sup>2</sup> Zone	Source of Information	Potential Contaminants <sup>3</sup>
1	Service Station	6-10 YR	Database Search	IOC, VOC, SOC
2	CERCLA site	6-10 YR	Database Search	IOC, VOC, SOC
	Highway 6	3-10 YR	GIS Map	IOC, VOC, SOC
	Burlington Northern Railroad	3-10 YR	GIS Map	IOC, VOC, SOC

<sup>1</sup> CERCLA = comprehensive environmental response compensation and liability Act

<sup>2</sup> TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

<sup>3</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

**Table 3. City of Potlatch, Ball Field Well, Potential Contaminant Inventory.**

Site	Description of Source	TOT <sup>1</sup> Zone	Source of Information	Potential Contaminants <sup>2</sup>
1	Service Station	6-10 YR	Database Search	IOC, VOC, SOC
	Highway 6	3-10 YR	GIS Map	IOC, VOC, SOC
	Burlington Northern Railroad	3-10 YR	GIS Map	IOC, VOC, SOC

<sup>1</sup> TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

<sup>2</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

**Table 4. City of Potlatch, Well #4, Potential Contaminant Inventory.**

Site	Description of Source <sup>1</sup>	TOT <sup>2</sup> Zone	Source of Information	Potential Contaminants <sup>3</sup>
1	LUST SITE	6-10 YR	Database Search	VOC, SOC
2, 3	SARA Site, UST Site	6-10 YR	Database Search	VOC, SOC
	Burlington Northern Railroad	0-10 YR	GIS Map	IOC, VOC, SOC, Microbials
	Highway 6	3-10 YR	GIS Map	IOC, VOC, SOC
	Palouse River	6-10 YR	GIS Map	IOC, VOC, SOC

<sup>1</sup> LUST = Leaking Underground Storage Tank, UST =Underground Storage Tank, SARA = Superfund Amendments and Reauthorization Act

<sup>2</sup> TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

<sup>3</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

### **Section 3. Susceptibility Analyses**

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix A contains the susceptibility analysis worksheets for the system. The following summaries describe the rationale for the susceptibility ranking.

#### **Hydrologic Sensitivity**

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquicard) above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity is moderate for all four wells. Area soils are poor to moderately drained, positively affecting the scores. However, each well had a water table of less than 300 feet, or unknown (Potlatch well). Well #4 had an aquicard, however the Ridge Well did not, and it was unknown if the Potlatch Well and Ball Field Well had aquitards due to missing well logs. The vadose zones of each well was either composed of predominantly permeable materials or was unknown. If well logs had been available for the Potlatch Well and Ball Field Well, scores might have been lower.

#### **Well Construction**

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced. A sanitary survey was conducted in 2000 for the system.

The Ridge Well rated moderate for construction. It was drilled in 1968 to a depth of 777 feet into shale. The 8 inch diameter (.25 inch thick) casing is perforated from 580 to 775 feet. Positively affecting the score is the fact that the well is located outside of the 100 year floodplain, and it's highest production of water comes from more than 100 feet below static water levels. However, the well does not have an annular seal, and the casing is not seated into a low permeability unit. In addition, although the well house and surface seal appear in good condition, the casing only extends 6 inches above the well house floor.

The Potlatch Well rated moderate for construction. No well log was available for this well, however information on the field survey data sheet noted that this well's 15 inch casing is 500 feet deep and extends 12 inches above the well house floor. The well head and surface seal are noted as being adequate. The well is located outside of the 100 year floodplain. Because no well log is available, it is unknown if the highest production comes from more than 100 feet below static water levels or if the casing(s) and annular seal extend into low permeability units. As a result, it is unknown if the well meets all of the current construction standards.

The Ball Field well rated moderate for construction. No well log was available for this well, however the field survey data sheet noted a 450 foot deep well with a maintained well house, well head, and surface seal. The well head is also located outside of the 100 year floodplain. Because no well log was available, it is unknown if the casing(s) and annular seal extend into low permeability units, or the if the highest production comes from more than 100 feet below static water levels.

Well #4 rated moderate for construction. The well has a 10 inch casing to 254 feet, an 8 inch casing to 405 feet, and is uncased the remainder of it's 605 feet depth. It's bentonite annular seal extends 60 feet into a sand/gravel/clay unit. The wellhead is located outside of the 100 year floodplain and the well's highest production comes from more than 100 feet below static water levels. The score was increased because the field survey data sheet noted the wellhead lacked a vent, and well log noted that the casing did not extend into a low permeable unit.

Though the wells may have been in compliance with standards when they were completed, current PWS well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. An eight-inch casing requires a thickness of 0.322 inches, a ten-inch casing requires a casing thickness of 0.365 inches, and a twelve- to twenty-inch casing requires a thickness of 0.375 inches. As such, the wells were assessed an additional point in the system construction rating.

### **Potential Contaminant Source and Land Use**

The Ridge Well rated high for IOCs (i.e. nitrates, arsenic), VOCs (i.e. petroleum products, chlorinated solvents), and SOCs (i.e. pesticides), and moderate for microbial contaminants (i.e. bacteria). The Potlatch Well and Ball Field Well both rated moderate for IOCs, VOCs, SOCs, and low for microbials. Well #4 rated high for IOCs, moderate for VOCs and SOCs, and low for microbials. The number and location of potential contaminant sources, as well as the amount of agricultural land within the delineations contributed to the land use scores.

### **Final Susceptibility Ranking**

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists.

Additionally, if there are contaminant sources located within 50 feet of the source then the wellhead will automatically get a high susceptibility rating. In this case, the Potlatch Well and the Ball Field Well both rated automatically high for all categories of potential contaminants due to the presence of drainage or diversion ditches within 50 feet of the wells. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking.

**Table 5 Summary of City of Potlatch Susceptibility Evaluation**

Well	Susceptibility Scores <sup>1</sup>									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Ridge Well	M	H	H	H	M	M	H	H	H	M
Potlatch Well	M	M	M	M	L	M	H*	H*	H*	H*
Ball Field Well	M	M	M	M	L	M	H*	H*	H*	H*
Well #4	M	H	M	M	L	M	M	M	M	M

<sup>1</sup>H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

H\* = Automatic high susceptibility due to drainage ditch or diversion ditch existing within 50 feet of the well

### Susceptibility Summary

The City of Potlatch drinking water system consists of four wells. The Ridge Well, Potlatch Well, Ball Field Well, and Well #4 supply approximately 880 people through 349 connections.

In terms of total susceptibility, the Ridge Well rated high for IOCs, VOCs, SOCs, and moderate for microbials. System construction and hydrologic sensitivity are both moderate, and land use rated high for IOCs, VOCs, SOCs, and moderate for microbials.

In terms of total susceptibility, the Potlatch Well rated automatically high for IOCs, VOCs, SOCs, and microbials due to a drainage ditch existing within the 50 foot sanitary setback distance of the well. If not for the automatic ratings, the well would have rated moderate for all four types of contaminants. System construction rated high, hydrologic sensitivity rated moderate, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbials. If the missing well log information had been available, scores might have been lower.

In terms of total susceptibility, the Ball Field Well rated automatically high for IOCs, VOCs, SOCs, and microbials due the surface water diversion ditches existing within the 50 foot sanitary setback distance of the well. If not for the automatic rating, the Ball Field Well would have rated moderate for IOCs, VOCs, SOCs, and microbial contaminants. System construction and hydrologic sensitivity both rated moderate, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbials.

In terms of total susceptibility, Well #4 rated moderate for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity both rated moderate, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbials.

## **Section 4. Options for Drinking Water Protection**

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Potlatch, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. No chemicals should be stored or applied within the 50-foot radius of the wellhead. As much of the designated protection areas are outside the direct jurisdiction of the City of Potlatch, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection. In addition, the well should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation encompasses urban and commercial land uses. Public education topics could include proper lawn and garden care practices, hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Lewiston Regional Office of the DEQ or the Idaho Rural Water Association.

### **Assistance**

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Lewiston Regional DEQ Office                      (208) 799-4370

State DEQ Office                                      (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, [mharper@idahoruralwater.com](mailto:mharper@idahoruralwater.com), Idaho Rural Water Association, at 208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

## POTENTIAL CONTAMINANT INVENTORY

### LIST OF ACRONYMS AND DEFINITIONS

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5 mg/L.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

## References Cited

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Idaho Department of Agriculture, 1998. Unpublished Data.

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Rember, W.C. and E.H. Bennett, 1979; Geologic Map of the Pullman Quadrangle, Idaho, Idaho Bureau of Mines and Geology, Moscow, ID.

Attachment A

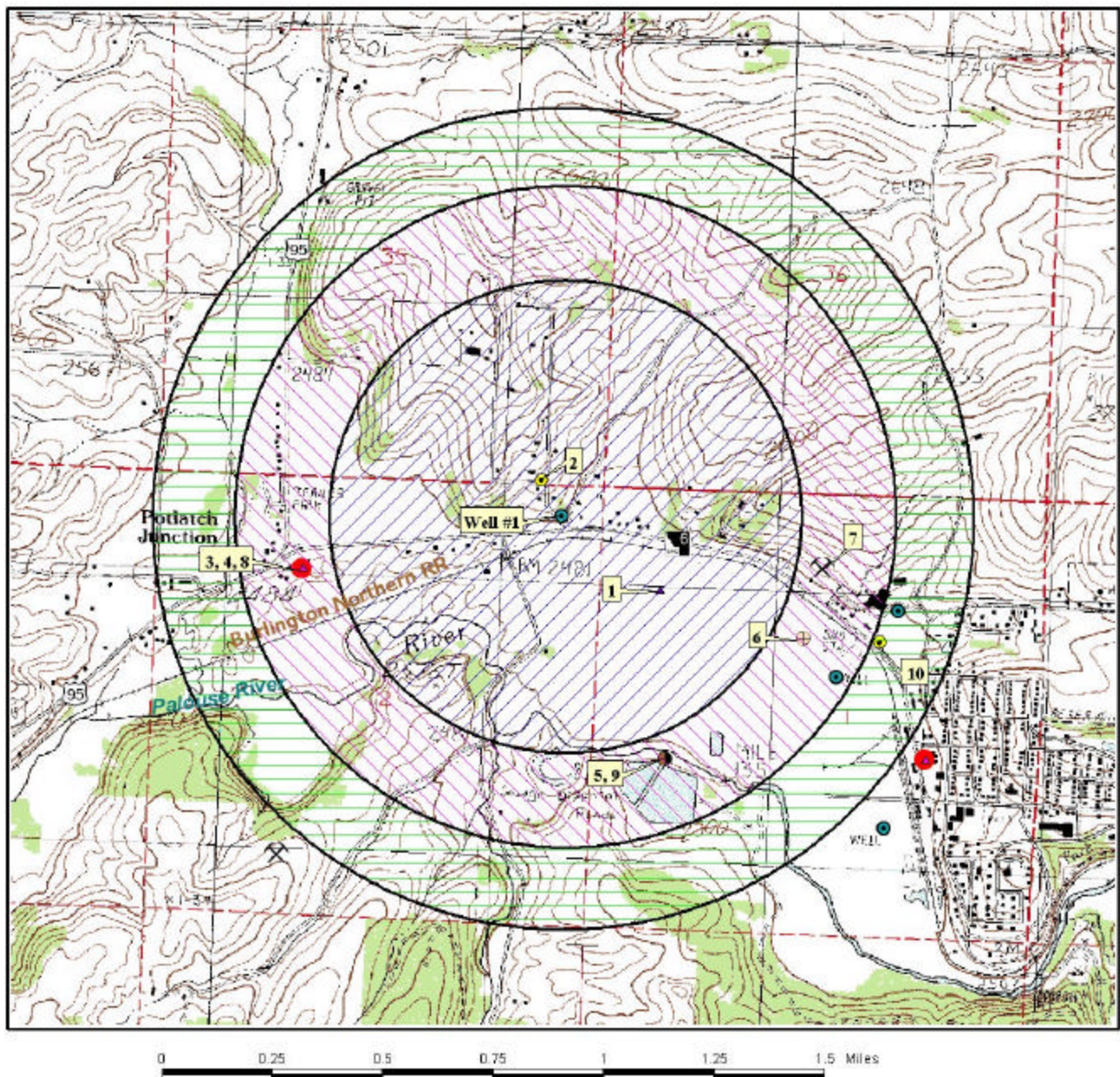
City of Potlatch

Figures 2, 3, 4, 5,

Susceptibility Analysis  
Worksheets



**FIGURE 2 - City of Potlatch Delineation Map and  
Potential Contaminant Source Locations**



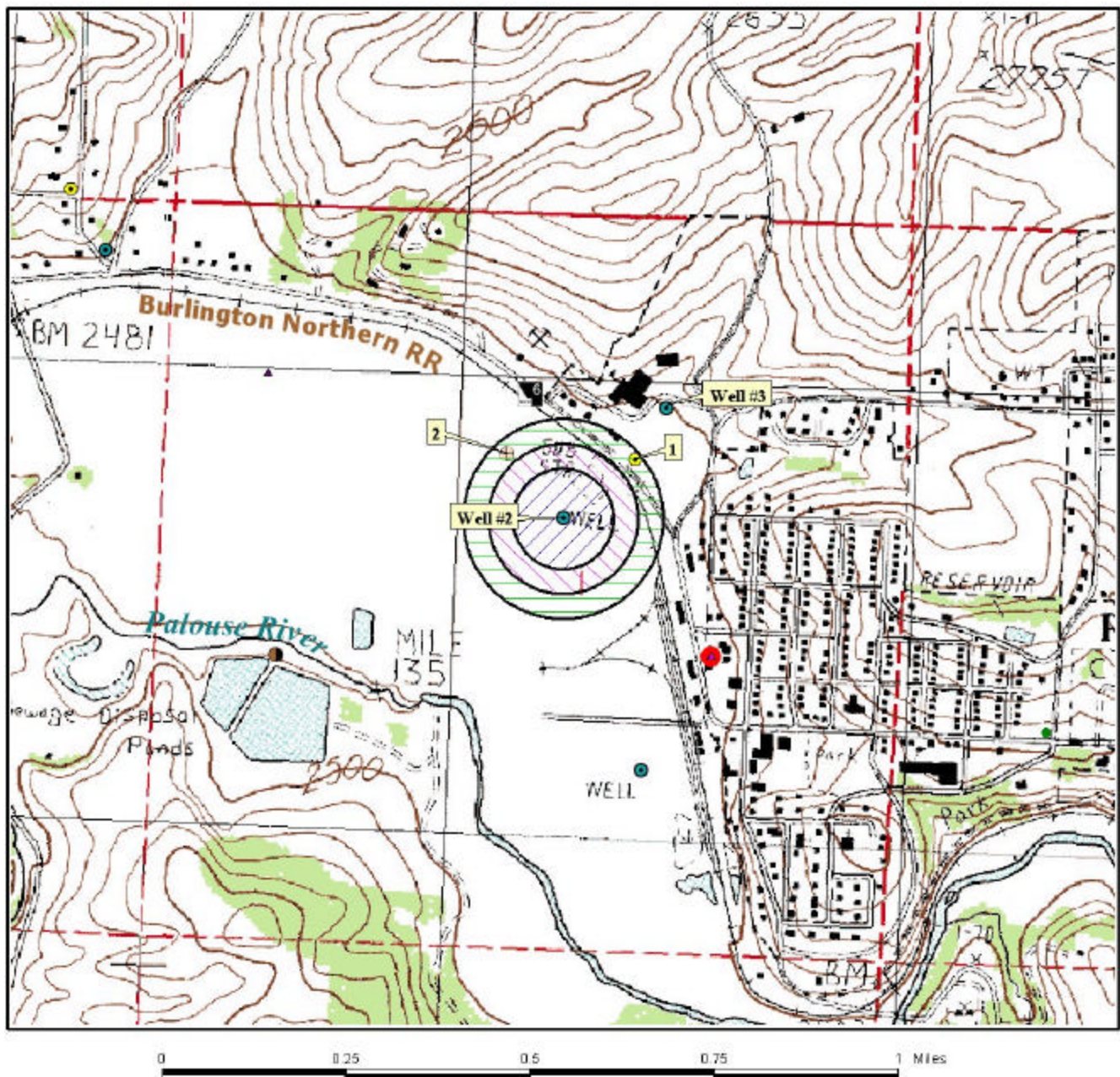
**Technical Services  
Data/GIS**

W. Kelley  
8/28/02  
d:\Kelley\swa-projects\  
Clearwater\_Uplands\  
potlatch.apr

**PWS# 2290030  
Well #1 Ridge W**



**FIGURE 3 - City of Potlatch Delineation Map and Potential Contaminant Source Locations**



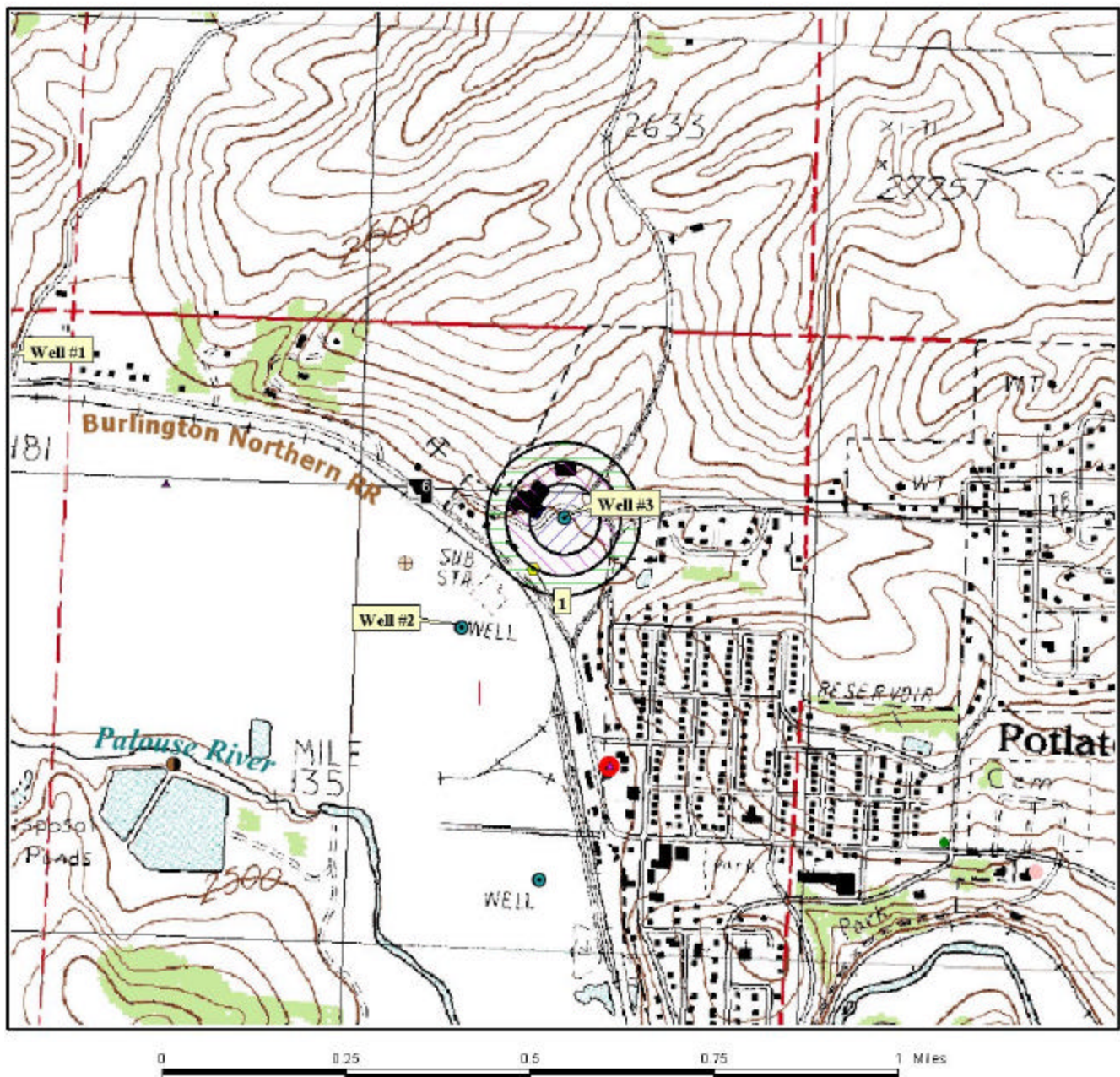
**Technical Services  
Data/GIS**

W. Kelley  
8/28/02  
d:\Kelley\swa-projects\  
Clearwater\_Uplands\  
potlatch.apr

**PWS# 2290030  
Well #2 W Pot**



**FIGURE 4 - City of Potlatch Delineation Map and Potential Contaminant Source Locations**



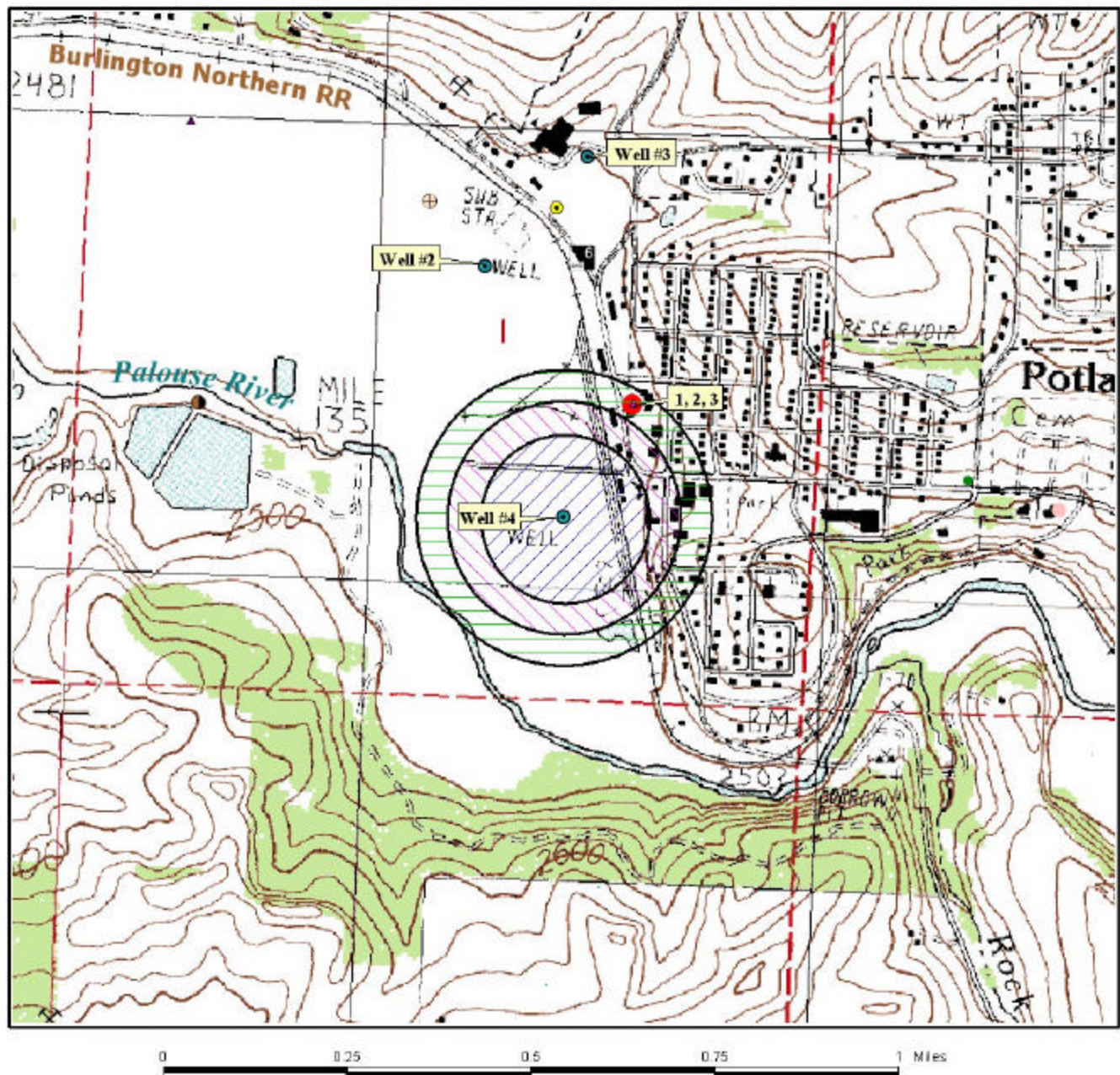
**Technical Services  
Data/GIS**

W. Kelley  
8/28/02  
d:\Kelley\swa-projects\  
Clearwater\_Uplands\  
potlatch.apr

**PWS# 2290030  
Well #3 Ball F1**



**FIGURE 5 - City of Potlatch Delineation Map and Potential Contaminant Source Locations**



**Technical Services  
Data/GIS**

W. Kelley  
8/28/02  
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Clearwater\_Uplands\  
potlatch.apr

**PWS# 2290030  
Well #4 S W Pot**

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5    Low Susceptibility

6 - 12   Moderate Susceptibility

≥ 13    High Susceptibility

## 1. System Construction

SCORE

Drill Date	08/23/1968	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	2001
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

## 2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

## 3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

## Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	3	4	3	3
(Score = # Sources X 2 ) 8 Points Maximum		6	8	6	6
Sources of Class II or III leacheable contaminants or	YES	3	3	3	
4 Points Maximum		3	3	3	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		13	15	13	10

## Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0

## Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0

## Cumulative Potential Contaminant / Land Use Score

25 25 25 12

## 4. Final Susceptibility Source Score

13 13 13 12

## 5. Final Well Ranking

High High High Moderate

## 1. System Construction

SCORE

Drill Date	01/01/1961	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	2001
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		5

## 2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

## 3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

## Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	0	0	0	0
(Score = # Sources X 2 ) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		4	4	4	4

## Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0

## Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0

## Cumulative Potential Contaminant / Land Use Score

16 14 16 6

## 4. Final Susceptibility Source Score

12 12 12 11

## 5. Final Well Ranking

Moderate Moderate Moderate Moderate

## 1. System Construction

SCORE

Drill Date	01/01/1939	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	2001
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

## 2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

## 3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

## Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2 ) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	YES	4	0	0	
4 Points Maximum		4	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		8	4	4	4

## Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	YES	1	0	0	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		3	2	2	0

## Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0

## Cumulative Potential Contaminant / Land Use Score

18 11 13 6

## 4. Final Susceptibility Source Score

12 10 11 10

## 5. Final Well Ranking

High High High High



## 1. System Construction

SCORE

Drill Date	03/19/1987	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	2001
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

## 2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

## 3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

## Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	1	1	1	1
(Score = # Sources X 2 ) 8 Points Maximum		2	2	2	2
Sources of Class II or III leacheable contaminants or	YES	5	1	1	
4 Points Maximum		4	1	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		10	7	7	6

## Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0

## Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0

## Cumulative Potential Contaminant / Land Use Score

21 16 18 8

## 4. Final Susceptibility Source Score

12 11 12 11

## 5. Final Well Ranking

Moderate Moderate Moderate Moderate